CFA Newsletter

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Does Africa need the Great Green Wall?

Ecologist Mamadou Diakite, in Mali, said "A decade ago, this land was dismissed as lost to the desert". But these trees are not part of the Great Green Wall.

It is a remaking of the planet on a grand scale, likely to be easily visible from space. A line of trees intended to be 15 kilometres wide and almost 8000 kilometres long has started to form across the hottest, driest and widest part of Africa. If it is ever completed, this band of green against gold will stretch from the Atlantic coast of Senegal, along the southern fringe of the Sahara desert all the way to the Red Sea.

What the African Union (AU) likes to call the Great Green Wall is envisaged as holding back the advancing sands of the Sahara and fighting climate change. Formally inaugurated in May 2016, 11 nations have signed up, headed by Senegal, whose president Macky Sall announced that it had already planted 12 million trees, mostly native acacias.

Some $4 billion has so far been promised for the project, which is being masterminded by forest scientists working for the AU. The World Bank, the European Union and private investors are all piling in. The final "wall" will number more than a billion trees.

The wall's backers say it will halt the desert's advance, cool the air with its shade, block sand storms, provide shelter for livestock, fertilise soils and protect water supplies. By bringing rural prosperity, it could also counter the rise of Islamic militants such as Boko Haram. Abdou Maisharou, director of Niger's National Great Green Wall Agency, has said it would "deter young people from leaving their lands [and so] combat terrorism". Wildlife could also benefit. Elvis Paul Tangem, who coordinates the project for the AU, claimed recently that

antelope, hares and birds are returning to newly forested areas in Senegal after a 50 year absence.

And yet questions abound. Will the trees prove sustainable? What part of the "desertification" process is it intended to prevent? Is advancing sand the real problem? Come to that, what's wrong with deserts anyway? Some ecologists say we should be saving deserts – and their unique flora and fauna – rather than fighting them.

The Great Green Wall has strong echoes of China's recent attempts to create a belt of 100 billion trees to hold back the Gobi desert. That project that shows some signs of improving vegetation and reducing dust storms. But few desert specialists believe it will work in the Sahara. "Technically it makes no sense," says Chris Reij of the World Resources Institute, a US think tank. "We don't need a Great Green Wall. It solves nothing. We need green landscapes instead."

Many believe the diagnosis of 'desertification' is wrong. The science behind an advancing Sahara is hotly contested. Many researchers say the whole idea – which has been a given of environmental debate since the 1970s – is a myth. One is UK-based geographer Mike Mortimore, who with Roy Behnke of the London-based International Institute for Environment and Development, recently co-authored the book *The End of Desertification?*

"There is no evidence of a catastrophic regional environmental crisis," Mortimore says. "Localised, even severe, land degradation certainly exists in the region." It may result from changing climatic conditions, overgrazing, clearing vegetation for farming, or dams and water diversions that deprive low-lying areas along rivers of their natural floods. But, he insists, these short-term local changes are being misread as part of a widespread, long-term trend.

In reality, deserts advance and retreat regularly, often as a result of routine climatic variability. Satellite data show how the desert margins fluctuate and how, in some areas, significant re-greening is taking place.

During droughts in the 1970s and 80s, the Sahara did in some places move south. At the time livestock herders were blamed for creating irreversible advances by overgrazing their animals on the fringes of the Sahara. But since the 1990s, the desert has retreated in many places, often as rains have improved.

Where deserts advance, says Mortimore, it is wrong to blame overgrazing. The UN Environment Programme, which once demonised livestock grazing as the prime cause of desertification, now says it is a highly sustainable method of using arid lands such as the margins of the Sahara.

There are other culprits where things go wrong. Jane Madgwick, director of the Dutch-based NGO Wetlands International blamed poor water management in some regions. Take Lake Chad, on the border between Niger, Nigeria, Chad and Cameroon, which is only a tenth the size it was a few decades ago. Its demise is often seen as a totem of the spreading Sahara. Yet its demise is caused not be pastoralists, but by irrigation dams on the rivers that once fed the lake. They have dried out downstream pastures, left tens of thousands of herders destitute, and caused the lake to dry out. Schemes touted as "greening" the desert are actually the cause of its spread.

The Great Green Wall is planned to pass through the heart of the huge basin of rivers that drain into the lake. But there is no way that planting trees can reverse the lake's fortunes.

In any case, the idea of seeing spreading deserts as an ecological disease is foolhardy. Deserts are natural ecosystems, home to numerous species that have made it their own, many of which are endangered. Traditional nomadic societies found ways to live in such environments, through hunting and herding animals. Modern farming methods fail without massive imports of irrigation water, which may create new deserts elsewhere.

Reij says that farmers across the region have found their own way of reviving their arid lands. Often they have done this by abandoning the advice given to them by governments to cut down native trees and are nurturing them instead. The results have been spectacular, says Reij. His research shows that trees growing amid crops retain water on the land, improve soils through dropping leaf litter and stave off drought.

I visited one such project in a remote region of Mali, near the ancient city of Djenne. Ecologist Mamadou Diakite was standing in the shade of one of hundreds of trees growing vigorously on what had once been parched land, abandoned by local millet farmers. "A decade ago, this land was dismissed as lost to the desert," he said.

Though the Mali government supports the Great Green Wall project, these trees were not the result of an official planting programme. Instead, local farmers had been encouraging the natural growth of trees on land at the edge of the desert. Rather than following long-standing advice from government agricultural advisers to uproot trees on their fields and chop out any new growth, they have nurtured them instead.

This approach began in neighbouring Niger more than a decade ago. Dubbed Farmer-Managed Natural Regeneration, it is now spreading, supported by NGOs such as Diakite's Mali-based organisation, Sahel Eco. "It was slow to take off, but now they all want to do it," says Diakite. "The land is coming back into production. Farmers use the wood for firewood and the leaves provide fodder for their animals and fertilise the soils." Far more trees have emerged in the landscape thanks to these farmers than from the Great Green Wall.

Some people within the Great Wall Project believe that such local, NGO-backed schemes are much more likely to be of benefit to desert ecosystems and farming systems alike than state-organized planting projects. Moctar Sacande, a forest ecologist at London's Royal Botanic Gardens in Kew, is masterminding a programme in Mali, Burkina Faso and Niger to consult villagers about native seeds for use in growing the Wall. The programme will collect the seeds locally, propagate them in nurseries and pay villagers to plant them. "We start by consulting communities," he says.

Reij believes that the strategy of the Great Green Wall needs a rethink to follow the farmers' lead, nurturing nature's ability to regenerate the landscape rather than thwarting it. The ultimate irony would be for a green landscape to emerge without a single further tree being planted.

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Association news

Outcomes of the 1st Commonwealth Forestry Association Conference in Nigeria

Group Photograph of Executive Officers of Commonwealth Forestry Association (CFA), invited guests and participants at 1ST CFA Conference 2016 in Nigeria

THEME OF THE CONFERENCE

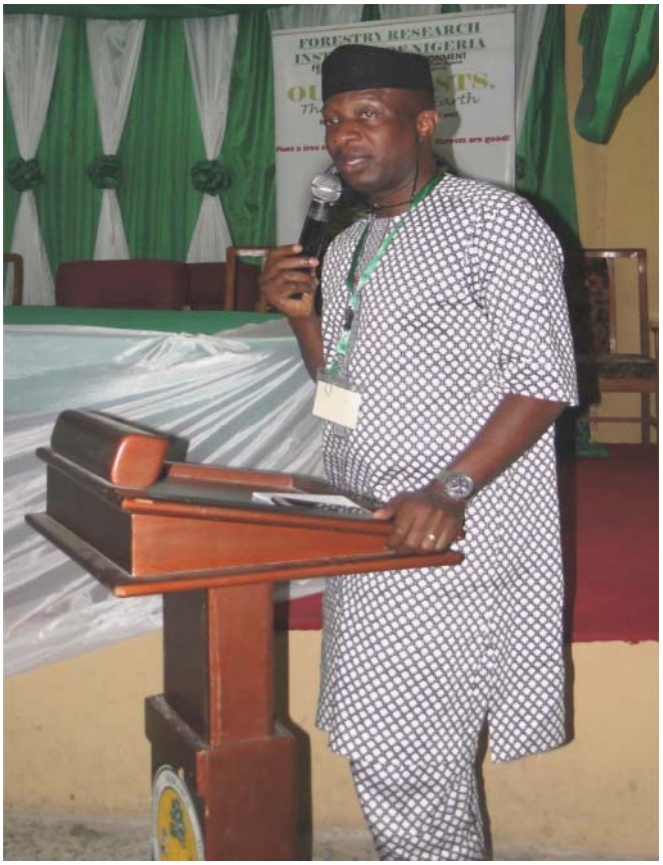
The theme of the 1st Commonwealth Forestry Association Conference 2016, Nigeria Chapter was '**Forestry and Allied Natural Resource Disciplines in Nigerian Institutions: Inputs for Future Solutions to Dwindling Forest Estate in Nigeria**'. The conference was held from 10 to 12 October, 2016 at Forestry Research Institute of Nigeria (FRIN), Jericho Hills, Ibadan, Oyo State, Nigeria. It was a research oriented conference that brought together forestry and allied natural resource scientists, graduates, development experts and policy makers from higher institutions and research institutes to proffer future solutions to the dwindling Nigerian Forest Estate. By standard, Nigeria is expected to reserve 25% of her Land under gazette forests. The colonial administration in Nigeria before independence reserved 10% of Nigerian land under forest. However, the remaining forest estate in Nigeria has dwindled without a drastic approach to revamp the forest reserves with gazette notices over the years. Scientists have been multiplying in Forestry and Allied Natural Resource Disciplines with various novel research findings in their institutions. The conference aimed at salient and coherent contributions of forest scientists in Nigerian institutions to proffer solutions to the complex problems militating against Nigerian Forest Estate. Added values to complement the 1st CFA Conference 2016, the Nigeria Chapter included an 'excursion' to International Institute of Tropical Agriculture (IITA) Forest Reserve, Idiose, Ibadan by participants and a 'workshop' on Quantum Geographic Information System (QGIS) in the Department of Forest Resources Management (DFRM), University of Ibadan, Nigeria.

Specific Outcomes of the 1st CFA Conference, Nigeria Chapter

Attendance

The 3-day conference was well attended by young and established forestry scientists in Nigeria. Scientists from the following universities and Institutes in Nigeria attended: University of Ibadan, Nigeria; Obafemi Awolowo University, Ile-Ife, Nigeria; Federal University of Technology, Akure, Nigeria; Federal University of Agriculture, Abeokuta, Nigeria; University of Benin, Benin City, Nigeria; University of Uyo, Nigeria; University of Ilorin, Nigeria; University of Calabar, Nigeria; University of Agriculture, Makurdi, Nigeria; Federal University of Dutsin-ma, Nigeria; Ondo State University of Science and Technology, Okitipupa, Ngeria; Federal University Gashua, Gashua, Yobe State, Nigeria; Tai Solarin University of Education, Ijagun, IjebuOde, Ogun State, Nigeria; University of Pretoria, South Africa; Universities Felix HouphouetBoigny, Abidjan, Cote d'Ivoire; Forestry Research Institute of Nigeria, Ibadan; Federal College of Forestry, Ibadan; Federal College of Forestry, Jos, Nigeria; International Institute of Tropical Agriculture (IITA) Forest Unit, Ibadan, Nigeria; Federal College of Animal Health and Production Technology, Moor-Plantation, Ibadan, Oyo State, Nigeria; Audu Bako College of Agriculture, Kano State, Nigeria; and Nigerian Institute of Social and Economic Research (NISER), Ibadan.

Five prominent teachers of teachers in Forestry Profession in Nigeria attended and participated in the conference. They were Emeritus Professor S. Kolade Adeyoju, Emeritus Professor D. U. U. Okali, Professor S. A. Oluwalana, Professor J. S. A. Osho and Professor M.S. Ayodele.



Dr. A.O. Adepoju, Executive Director, FRIN declaring 1st CFA Conference in Nigeria opened on the 10 October, 2016

Deni Bown (Forest Manager, IITA Forest Reserve) presenting the lead paper at CFA Conference 2016

Emerging Issues at the Conference

The following emerging issues were discussed and deliberated upon at the conference:

i. Dwindling Forest Estate in Nigeria
ii. Forestry Profession
iii. Creation of more Forestry Research Institutes in Nigeria
iv. Proposal for Federal Government owned Forest Estate in various States in Nigeria

Communiqué

The following communiqués to CFA United Kingdom, Forestry Decision Makers and to our Peer Colleagues were made at the Conference:

1. **Consolidation of Remaining Forest Reserves in the 36 States of the Federal Republic of Nigeria**
   The geometrical progression in population of Nigerians over the years has been depriving State Forestry agencies to meet the International Standard of 25 percent forest reservation set for every country in the world. Therefore, every state in Nigeria should of necessity consolidate her remaining forest estate and also create a friendly environment for *Joint Forest Management*, *Community-Based Forest Management*, and *Private participation* in forest investment to increase forest cover.

2. **Forestry Profession**
   The number of forestry graduates in Nigeria these days has tremendously increased because virtually all the states in the federation have Universities where forestry as a discipline is taught. However, a lot of these graduates are unemployed. The latent opportunities where these graduates should be fully engaged are yet to be explored by state governments. An example is the massive replenishment of exploited forest reserves with enrichment plantations of indigenous and exotic species. Employment of these forestry graduates in all of the 36 States in Nigeria is imperative for the implementation of research outputs in the six geo-political zones in Nigeria.

3. **Creation of additional Four Forestry Research Institutes in Nigeria**
   The agricultural sector in Nigeria has more than Twenty (20) Research Institutes while the forestry Sector has only one research institute. In the quest for expansion of knowledge in Renewable Natural Resources in Nigeria, the **University of Ibadan, Nigeria** recently made a giant stride for the splitting of the Faculty of Agriculture and Forestry through the National Universities Commission (NUC), Abuja into two, namely:
   i. Faculty of Agriculture; and
   ii. Faculty of Renewable Natural Resources.

The Faculty of Renewable Natural Resources, University of Ibadan, Nigeria now has four approved Academic Departments under the auspices of NUC, Nigeria as follows:

a. *Department of Forest Production and Products*
b. *Department of Social and Environmental Forestry*
c. *Department of Aquaculture and Fisheries Management*
d. *Department of Wildlife and Ecotourism Management*

It is therefore, recommended that for the forestry profession to be relevant to the economy of Nigeria, an additional four new Forestry Research Institutes should be created by the Federal Government of Nigeria. The new institutes are proposed as follows:

a. *Institute of Forest Production and Products*
b. *Institute of Social and Environmental Forestry*
c. *Institute of Forest Policy and Economics*
d. *Institute of Wildlife and Ecotourism*

4. **Proposal for Federal Government owned Forest Estate**

The Federal Government of Nigeria should diplomatically liaise with all the 36 States for the acquisition of at least 50,000 hectares of land in each state of the federation for the immediate future creation of the Federal Government Forest Estate. This would enable the Federal Government to increase the forest cover in all the states in Nigeria. The creation of the Federal Forest Reserve in each state of the Federation would enhance the quantity and quality of forest resources available to Nigerians.

Group Photograph of Participants with Deni Bown-Head of Forest Unit*, International Institute of Tropical Agriculture (IITA) on excursion to IITA Forest Reserve*

Request for information on orphaned tropical forest data

We hope to compile information on orphaned data for tropical forests, including inventory and plot data, that are in danger of being lost. Many projects over the years have generated a lot of tropical forest data. But the information is scattered among different institutions and people, some still only on paper, some digitized but in older formats.

TROPIS and ATROFI-UK are two previous databases that compiled metadata on forest plots and inventories. The data for certain plots are available at www.forestplots.net and its associated networks. But other plots and inventories still need attention, re-discovery even. We would like to compile information on datasets that should be digitized or transformed to an up-to-date digital format. The goal is firstly to make metadata on these datasets available on a publicly accessible website, and then to try to secure the data itself by pushing for appropriate curation with open-access availability.

These legacy datasets are invaluable for understanding how tropical forests change through time, including the cumulative impacts of changes in land use and climate, and changes in patterns of biodiversity and carbon storage. The past can help inform the future.

If you know of any such orphaned databases for tropical forests, please send a message to: Gillian Petrokofsky gillian.petrokofsky@zoo.ox.ac.uk or Sheila Ward sheila.emily.ward@gmail.com.

Gillian Petrokofsky
Researcher, Department of Zoology, University of Oxford

Forest Scenes

City of Trees: a new project aims to plant a tree for every man, woman and child living in Greater Manchester

Tree planting for a greener future in Manchester

City of Trees, launched in November 2015, aims to plant three million trees – one for every man, woman and child in Greater Manchester over the next 25 years. The scheme is also looking to transform 2,000 hectares of currently under-used, un-loved woodland back into use for the community.

The movement was instigated by the Community Forest Trust, which has a rich history over 25 years greening Greater Manchester, and The Oglesby Charitable Trust. It aims to gain the support of businesses, organisations and community groups in helping to reach the ambitious targets. To date the movement has planted over 94,000 trees, brought over 200 hectares of woodland back into management as well as creating over 30 urban orchards.

Tony Hothersall, *City of Trees*, explains about the importance our trees and woods; *"The benefits of trees are well documented; they create healthier, happier communities, tackle climate change, reconnect our children to the natural world, and provide essential habitats for wildlife."*

The movement aims to engage a whole range of organisations including community groups, businesses, social housing providers, local authorities as well as public sector bodies. To date there are 49 partners on board, all supporting the movement in a variety of ways from sponsoring projects, giving pro-bono support, working together on schemes to sharing their tree planting success.

As well as engaging other organisations, the charity wants the public to be part of the initiative and since its launch has connected with over 7,000 people face-to-face through events, walking activities and planting schemes. To help engage the public, *City of Trees* runs monthly volunteering sessions across Greater Manchester, where anyone can come along to plant a tree, learn how to manage a woodland and even bash some balsam!

Tony Hothersall comments "*By getting people out and about in the great outdoors we hope to show how important trees, woods and wildlife are."* The organisation welcomes people who want to use employee volunteering days to get involved in practical projects on the ground, as well as students and anyone with a passion to help green Greater Manchester.

City of Trees also works with schoolchildren and aims to connect them with the nature of their doorstep by creating outdoor play areas, involving pupils in tree planting and linking classroom activities to the natural world. Having worked with thousands school children to date, the charity advocates the benefits of outdoor education.

Tony Hothersall comments *"There is a wealth of evidence showing that nature-based learning supports significant improvements in social studies, science, language, arts and maths."* He adds; *"We feel it's especially important to work with children around trees and woods to ensure they preserve and protect them for future generations".*

The team behind City of Trees have been planting trees across Greater Manchester and work with their partners and landowners to identify land for tree planting. Tony Hothersall explains; *"It could be extending existing woodland and building up biodiversity or linking our woods and green space. We also plant totally new areas of woodland."*

Recent successes include creating a 4,000 tree new woodland at Snipe Clough in Oldham, a former landfill site, as well as working with the local community and school to bring a Wythenshawe woodland back to life. *City of Trees* also specialises in greening up urban areas, and advocates for the importance of planting trees in towns and cities.

Mr Hothersall comments; *"It is about planting trees wherever it's appropriate and ensuring we plant the right tree in the right place – at the right time."*

Flagship projects for the movement include City Forest Park – an exciting new vision in partnership with the Forestry

Commission which looks to create an amazing urban woodland on an unprecedented scale. City Forest Park is a network of private land, unused sites and managed public space just 3 miles from the heart of Manchester City Centre. Standing at 330 hectares, it's the size and scale of Central Park in New York.

Alongside the Forestry Commission, *City of Trees* hopes to breathe new life into it for the benefit of the whole City region community, transforming the landscape by planting trees, bringing woodlands back into use and creating new paths and cycle networks. Tony Hothersall comments *"This is an ambitious project and we're seeking investment to help realise the vision and create a truly amazing forest park for everyone to enjoy."*

The charity also utilises the power of trees in combatting surface water which can lead to flooding in cities and towns. Their Howard Street project, the first of its kind in the UK, saw three London plane trees planted in a specially designed trench in Howard Street, Salford, in June 2015 with the aim of capturing the impact that trees had on both cleaning polluted water from road run off and managing levels of surface water, which can lead to flooding.

The project produced promising initial monitoring results (June 2016) which revealed that the average water volume retention by the tree pit system was approximately 40% and the average storm peak reduction was 50%. Storm waters were also slowed by the system by up to 2 hours.

Dr James Rothwell from the University of Manchester, who is leading up the research element of the scheme, said *"These results demonstrate that retrofit tree planting schemes in towns and cities can be used as a nature-based solution to tackle urban flooding".*

Tony Hothersall comments; *"We know that trees and woods are an essential part of the fabric of our lives and provide us with a huge range of benefits. We're working to ensure that they are considered as part of all future growth and development, as we believe they play a crucial role in ensuring Greater Manchester becomes a world class City region we can all be proud of."*

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Participatory approaches work

Sustainable energy: Women gather a week's supply of woodfuel from the protected forest in Mt Mutis. (Photo: F. Soriano)

This article reports the ex-post evaluation of the project funded by the International Tropical Timber Organization (ITTO)PD 521/08 Rev. 3 (I): *Participatory forest management for sustainable utilization of non-timber forest products surrounding the protected areas of Rinjani and Mutis Mountains, Nusa Tenggara Province, Indonesia* conducted in May 2015. The Directorate General of Watershed and Social Forestry, an agency under the Government of Indonesia's

Ministry of Forestry, implemented this project in collaboration with WWF and the West Nusa Tenggara Provincial Forest Service, from June 2011 to August 2013.

At least 36 kinds of non-timber forest products (NTFP) are found in the protected areas of Mt Rinjani and Mt Mutis. These include honey, avocado, durian, jackfruit, candlenut, sugar palm, tamarind, coffee, cacao, sandalwood oil, eaglewood, resin, rattan, bamboo and several medicinal herbs. Forest farmers and gatherers are allowed by the Provincial Forestry Service to harvest non-timber forest products in the protected areas by issuing forest utilization permits but only to community-based cooperatives. The problem was that only a few communities met the required management skills and knowhow to operate cooperatives.

In this ITTO project, local experts used community participatory approaches in the development and the implementation of skills training modules, business models, management plans and policy options to support the sustainable use of NTFP. The project involved forest farmers and gatherers, small-business entrepreneurs, community leaders, district and provincial government officers, and local parliamentarians.

The most important achievements of the project were the expansion of the forest area covered by sustainable forest management, and the implementation of policies to support sustainable use of NTFP. Communities in North Lombok, Central Lombok and South Central Timor were able to set up and operate their own cooperatives, hence granted community utilization permits covering an additional of at least 3385 hectares of protected forests. To complement the project's achievements, the provincial government provided financial support to the districts of North Lombok and Central Lombok to implement three new decrees on the sustainable use of NTFP. At the time of the project ex-post evaluation, the district of South Central Timor had also issued similar decrees.

A notable effect of the new local government policies supporting NTFP is the increased financial support for NTFP development from the national government, the Central Bank of Indonesia (Mataram City) and the local governments. The project's outcomes also led to the inclusion of NTFP as priority commodities in West Nusa Tenggara's Five-Year Plan – this providing incentive to communities outside the project to implement policies supporting the sustainable use of NTFP, and the National Training Center of Indonesia to offer training courses on sustainable management and utilisation of NTFP to interested communities.

The complete article is found in Tropical Forest Update Volume 25, Number 2, 2016 at http://www.itto.int/tfu_back_issues/. Tropical Forest Update is the official newsletter of the International Tropical Timber Organization, to promote the conservation and sustainable development of tropical forests

Florence Soriano
Perth, Western Australia

Village limits: *Fatumnasi village in Mt Mutis viewed from the adjacent protected area, the border of which is lined with a rigid lattice of tree branches. (Photo: F. Soriano)*

Youth

Youth in forestry attend COP22

In 2016 IFSA had the opportunity to send a team of delegates to the UNFCCC COP 22 (United Nations Framework Convention on Climate Change Conference of Parties 22) in Marrakech, Morocco. IFSA is the International Forestry Students Association – a student run NGO that unites forestry students from around the globe both through media and regional, global and strategic meetings. The IFSA delegation was awarded eight observer passes, spread over the course of two weeks. It was exciting to arrive in the bustling city comprised of small alleyways full of motorbikes, donkeys and horses, alongside countless markets and busy locals. On the city's edge lay the COP22 Village where we arrived on day one as the opening Plenary Session was commencing. We joined the back of the tent to hear the opening speech from Ségolène Royal, last year's French COP President. She laid down the premise of this meeting – action and progress for the Paris Agreement with a focus on one of the most affected and under prepared regions, Africa. The hand over to this year's Moroccan President, H.E. Salaheddine Mezouar, saw a call to be more ambitious in our negotiations and actions. He addressed the need to focus on the most vulnerable populations in order to move forward as a whole. An African proverb rang true: *The sun does not ignore a village just because it is small*. Whilst this early entry into the Paris Agreement is hugely positive and encouraging, it is clear the path forward is not easy and much will be held in the follow through of our words post-COP.

The importance of this theme became clear as we visited the exhibits and side events throughout the day. The continent of Africa is responsible for just 4% of the world's Greenhouse Gas emissions, yet it contains six of the ten most severely affected countries. Already there are 10 million climate refugees in Africa and 65% of the population is affected by climate change. These sobering facts left me marvelling yet again at the inequalities of this world. However defeating, the atmosphere was filled with optimism and positivity. The exhibits throughout the village displayed the ideas and progresses of different nations and independent groups. These were showcasing everything from the newest electric vehicles and models of solar panel farms, to pro-nuclear power arguments and technology used to pull water out of the air for drinking.

Aside from these exhibits and the high level negotiations going on in the next tent, there were many diverse side events to attend. These discussions were held by a great range of stakeholders including politicians, scientists, youth groups, indigenous tribespeople, government bodies, various NGO's and the United Nations themselves. The IFSA delegation spread themselves around these events listening in on many topics regarding climate change and how to advance this Paris Agreement forward. Whilst I cannot relay all our findings here you can read more on the IFSA blog which is accessible here: <https://blogifsa.wordpress.com/category/cop-22/>

Throughout the week it became evident that the whole world *is* changing and moving towards a greener direction. This is heavily aided by the fact it is becoming financially beneficial to do so. Much of this stems from big investors that are demanding sustainably labelled businesses to invest in. For example, the Norwegian Government Pension Fund, the world's largest sovereign wealth fund, is channelling its investments into green infrastructure projects. This is both for ethical reasons *and* as they believe they can produce the same profitability as from other investments. Furthermore, these investments will only flourish further into the future. The private sector too is changing the supply chain structure to include more sustainable business practices, due to customer demand. Big impacts are

Celebrations at COP 22

coming from companies with huge buying power that are committing to choosing sustainable or deforestation free products. For example, McDonalds has committed to buying deforestation free beef. Therefore, we need sustainable supply chains and green business practices for these companies to invest in.

In terms of forestry at COP, the focus was largely centred around developing countries. This was demonstrated through action on REDD+. Different nations shared their experiences and progresses in respect to their applications and involvement in REDD+ trials. Exciting developments in satellite imagery and the applications of this technology in forestry were also displayed. Especially in regard to forest monitoring and reporting which can be more easily and swiftly performed, and where transparency of results is facilitated. Additionally, there was a strong presence from indigenous groups presenting evidence around their demonstrated long-term ability to care for and sustainably manage forests. Indigenous representatives from around the globe presented data showing that the locations of their lands contain healthier, more carbon rich forests than those outside of these lands.

The ability to attend this event as a member of the youth was invaluable. *Currently 50% of the global population is comprised of youth*. Yet there are very few opportunities for young members of society to impact on decision making. The youth of this world are the engines of social change, and I heard from some really powerful young people throughout the week with inspiring tales of groups spreading awareness around climate change. The youth at COP were energized and ambitious. And it is no wonder why – not only do we inherit the problem, we inherit the solutions too. The impassioned and deeply inspiring speeches, made by young and old over youth and future generations day, all sang the same message: *we must ensure the youth are involved in the decision making process*. The negotiations must include all involved demographics; and despite being young and relatively inexperienced, the youth *are* qualified to make decisions – it is about the capacity of the person, not their age. Some advice I noted down throughout the day: Make noise. Do not be assured with promises. Demand results.

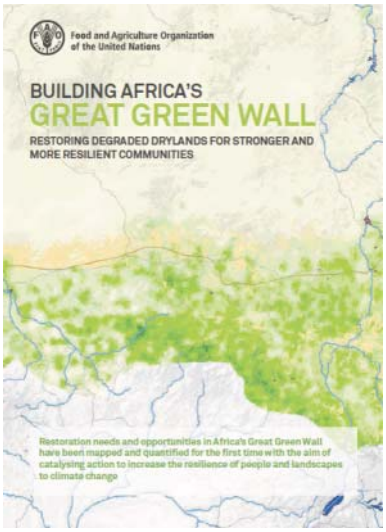
Over all the experience was hugely enlightening. It both provided insight into global policy development as well as much food for thought as we progress further towards adaptation to a warming planet.

Charlotte Ross-Harris
IFSA Head of Sub-Commission UNFCCC
University of Melbourne

Publications

Building Africa's Great Green Wall

FAO



The Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI or GGW as referred to hereafter) is Africa's flagship initiative to build prosperity and resilience in over 20 countries around the Sahara. It was built to combat the effects of climate change and desertification and address food insecurity and poverty. Endorsed by the African Union in 2007 as a game-changer in Africa's drylands, the initiative aims to transform the lives of millions of people by creating a great mosaic of green and productive landscapes across North Africa, Sahel and the Horn. A wide range of actors and stakeholders in African countries north and south of the Sahara are involved, and many international organizations are lending their support.

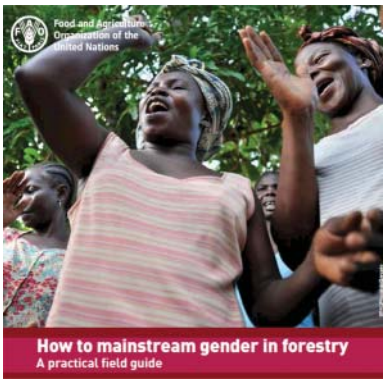
Countries have made land restoration a priority in the GGW regional harmonized strategy, as well as in their national strategies and action plans. Early results show that degraded lands can be restored, but these achievements pale in comparison with what is needed.

This brochure contributes to the understanding of what is needed in terms of restoration in the GGW area, considering primarily tree-based systems. It charts the size and provides a regional overview of the restoration challenge and opportunities, drawing on data collected on trees, forests and land use in the context of the Global Drylands Assessment conducted by FAO and partners in 2015–2016.

Download at http://www.fao.org/documents/card/en/c/05b6b210-62a5-4c4b-876d-2f55bd483d1c/

How to mainstream gender in forestry: A practical field guide

FAO



Gender mainstreaming is a central part of FAO's Strategic Framework and its policies and programmes. It is defined by the United Nations as: "The process of assessing the implications for women and men of any planned action including legislation, policies and programmes in all areas and at all levels. It is a strategy for making the concerns and experiences of women and men an integral part of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres, so that women and men benefit equally and inequality is not perpetuated." (UN Economic and Social Council, 1997).

This gender mainstreaming guide has been designed to assist FAO technical officers, in particular officers working in forestry, to develop actions in forestry-related projects and programmes at headquarters and in all regions. An example of such an action would be to involve local women's organizations as key stakeholders during the formation of a project or programme. This would allow the scope and focus of desired outcomes to be more representative of the women's needs and ensure the pursuit of gender equality objectives.

This guide is divided into three sections. The first section outlines an important starting point in the process: conducting a gender analysis. The gender analysis will help you assess the aspects related to gender in your work. It will also enable you to redress any shortcomings or inconsistencies in the design of your project or programme. The second section identifies key opportunities for gender mainstreaming. Tangible steps on how to mainstream gender across four thematic areas – participation, capacity development, institution building, and sex-disaggregated data – are described. The guide concludes with a discussion on follow-up actions and further resources that can help you put your project or programme into context. Using this guide, officers working on forest-related issues will be able to identify concrete actions to ensure that gender issues are integral components of projects and programmes, while determining when outside expertise is needed to achieve desired results.

Illegal Logging and Related Timber Trade – Dimensions, Drivers, Impacts and Responses

Editors: Daniela Kleinschmit, Stephanie Mansourian, Christoph Wildburger, Andre Purret – CIFOR

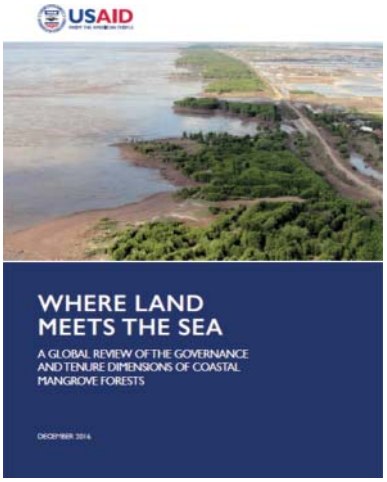
This report entitled "Illegal Logging and Related Timber Trade – Dimensions, Drivers, Impacts and Responses" presents the results of the fifth global scientific assessment undertaken by the GFEP initiative. The report set out to gain deeper understanding of the meaning of illegal logging and related timber trade, its scale, drivers and consequences. It provides a structured synthesis of available scientific and expert knowledge on illegal logging and associated timber trade while adding to existing studies and reports by sharing new insights, including a criminology perspective and new information about timber and timber product trade flows as well as exploring future policy options and governance responses.

This assessment report and the accompanying policy brief provide an authoritative source of information for policymakers and stakeholders involved in the fight against illegal logging and associated timber trade, in order to support effective action in tackling this pressing global problem.

Download at http://www.iufro.org/science/gfep/illegal-timber-trade-rapid-response/report/

Where the land meets the sea – a global review of the governance and tenure dimensions of coastal mangrove forests

USAID/CIFOR



Mangrove forests that incorporate local communities into their management fare better, a new study finds. Recognizing the importance of gender and community rights in mangrove use and planning prevents the deterioration of these fragile ecosystems. These are some of the conclusions of a new global study on mangrove governance from The Center for International Forestry Research (CIFOR) released today, on World Wetlands Day. Scientists conducted a review of international literature as well as case studies in Indonesia and Tanzania.

According to the study, mangrove forests are overwhelmingly managed by government institutions. They often fall under the jurisdiction of multiple ministries, from the Ministry of Forestry to the Ministry of Fishery, creating a maze of vague responsibilities that deliver little protection on the ground.

Typically, mangroves are classified as protected areas, but officials often lack the resources needed to effectively protect them. Compounding this challenge are local communities who continue to be active users of mangrove forests, but who do not have clear or documented rights and incentives to sustainably use or protect them for the long term.

"Despite government intentions to manage them sustainably, governance regimes are generally ineffective at conserving mangroves because they generally fail to involve communities," says Steven Lawry, CIFOR's Director of Forests and Governance Research, who worked on the report.

"Our findings show that mangroves tend to deteriorate where community rights are not respected or recognized."

What's more, gender equity remains a missing element in mangrove conservation.

"In the literature review there was hardly anything on gender, and then when we looked at the ground level we saw exactly the same thing – a widespread gender blindness in mangrove management," says Esther Mwangi, Principal Scientist at CIFOR who helped lead the study.

To date, research on mangrove forest management has focused on the ecological aspects of restoration. Little analysis exists about the ways land governance, resource rights, and land use planning—the social aspects of the conservation challenge—affect mangrove restoration.

This new study aims to change that, supporting a shift to mangrove forest management models where coastal communities have a more active role.

Countries are slowly recognizing the importance of identifying mangrove management approaches that deliver results on the ground.

In Tanzania, there is a growing recognition of the weakness of top-down mangrove protection approaches. Joint forest management and group rehabilitation schemes with local communities are increasingly being proposed in an effort to foster more community-led management.

In Indonesia, local community leaders are spearheading mangrove conservation efforts after understanding the ability of mangroves to protect their coastal homes and livelihoods.

The CIFOR study forms part of a broader study that includes national-level assessments in Indonesia and Tanzania. It was carried out under the USAID-funded Tenure and Global Climate Change Program.

Around the World

Afghanistan: Taliban leader urges Afghans to plant more trees

The leader of the Taliban in Afghanistan, Hibatullah Akhundzada, has urged Afghans to plant more trees. In a statement, he called on civilians and fighters to "plant one or several fruit or non-fruit trees for the beautification of Earth and the benefit of almighty Allah's creations".

Afghanistan has a severe problem of deforestation. Trees are cut down for heating and illegal timber sales.

Statements from the Taliban on environmental issues are rare. Akhundzada, who became leader of the Taliban last May, has a stronger reputation as a religious leader than a military chief.

Sunday's "special message", carried on official Taliban outlets, was in stark contrast to the more familiar fiery rhetoric against the Afghan government and its Nato coalition backers. "Tree plantation plays an important role in environmental

protection, economic development and beautification of earth," the Taliban leader said, in a report carried by the Afghan Taliban Voice of Jihad website. "Planting trees and agriculture are considered actions which hold both worldly good and benefit as well as immense rewards in the hereafter."

A spokesman for Afghan President Ashraf Ghani, Shah Hussain Murtazawi, described the statement as an attempt to deceive public opinion and to distract from the Taliban's "crimes and destruction".

The Taliban is more usually associated with Afghanistan's illicit production of opium, which it taxes in areas under its control. The group ruled most of Afghanistan from 1996 until it was toppled by a US-led coalition in 2001. It has since been offered a role in government in return for ending their insurgency but its leaders have so far refused. The presence of international troops in the country is believed to be the main stumbling block.

bbc.co.uk

UAE: The future health of our forests requires prudent investment now

In Abu Dhabi, there are 242,000 hectares of forest containing approximately 20 million trees of which 88 per cent are unique to this region. The benefit of these forests include the protection of critical infrastructure such as roads from sand movement, the provision of habitat for approximately 55,000 animals such as gazelle and rising quality of life standards in Abu Dhabi. However, these forests cannot survive in our climate without continuous management and irrigation.

The Environment Agency Abu Dhabi has managed these forests since 2006 with the implementation of a strategic approach to maintain and enhance the benefits of this cultural heritage while ensuring their long-term environmental and financial viability.

The forests of Abu Dhabi consume around 214 million cubic metres of water. This water is made up of 80 per cent groundwater and 20 per cent treated sewage effluent and desalinated water. Groundwater in Abu Dhabi is close to a non-renewable resource. As a result of irrigation for agriculture and forestry, we are extracting more than 20 times the volume that is recharged annually. The result is the rapid depletion of aquifers. Switching to alternative water sources, in particular desalinated water, comes with its own challenges of high cost and high emissions of greenhouse gases, other air pollutants and brine.

To ease the pressure on our water resources and ensure the longer term viability of the forests, the agency has been focusing on reducing water use in forests. As of January this year, we have reduced the water use in forests by 28 per cent from 2015. Irrigation schedules and equipment have been modified where appropriate, leading to focused and targeted irrigation and an improvement in water efficiency. In addition, 56 forests have now been supplied with treated sewage effluent resulting in improved growth due to lower salinity and enhanced nutrient availability.

In 2014, the agency established a research programme with the government of New Zealand and the International Centre for Biosaline Agriculture with the mission to study the water requirements of date palm and other native tree species. It was assumed that forest trees require more water in the summer and therefore irrigation is increased. However, our research shows that for some tree species such as ghaf and sider, higher summer temperatures cause the trees to lose their leaves and adopt a near dormant state, which means they require less water. We are now in the process of working out how these results can be translated from the experimental plots to the whole forest.

Beyond water savings, the agency has also made other improvements in how forests are managed. Between 2012 and 2015, we embarked on a programme to electrify water pumps and so far we have replaced 593 diesel water pumps with electric pumps with a small number powered by renewable solar energy. This shift, coupled with an overall decrease in pumping, has resulted in an estimated reduction of over 10,500 tonnes of carbon dioxide per year or the equivalent of taking 2,200 cars off the road a year. We have implemented the first genetic evaluation of the sand gazelle to better understand the species. In another significant initiative, the agency, in partnership with Abu Dhabi Sewerage Services Company and the Regulation and Supervision Bureau, has been testing the use of bio solids from sewage treatment to enhance the soil condition in forests.

The agency has also adopted and embraced this improvement and efficiency programme for forests and achieved significant success in reducing the cost and water use of forests while optimise the benefits.

We have now handed the management of the forests over to the Department of Municipal Affairs and Transport to continue the implementation of this work. The agency will work closely with the department to ensure the findings of the research into the water demands of different tree species is used to inform management plans for forests leading to water savings.

Our continuous drive for water efficiency will be enhanced by the implementation of the new groundwater law (Law No 5 of 2016 for Groundwater Regulation), which enables the agency to issue permits for groundwater with a specified limit on the water that can be taken. It is only through this continued focus on efficiency in forestry that we can ensure the long-term viability of our forests and to ensure the benefits are optimised and available for future generations.

thenational.ae

Africa's tallest tree measuring 81m found on Mount Kilimanjaro

It's definitely a contender. Africa's tallest indigenous tree – measuring a whopping 81.5 metres – has been discovered in a remote valley on the continent's highest mountain, Kilimanjaro. The colossus in Tanzania has matched Africa's previous tree-height record established by a specimen of the introduced Sydney blue gum (*Eucalyptus saligna*) in Limpopo, South Africa, which died in 2006.

Andreas Hemp at the University of Bayreuth in Germany first spotted a bunch of tall *Entandrophragma excelsum* trees while exploring Mount Kilimanjaro's vegetation 20 years ago. But it was not until recently that he and his team were able to measure their heights accurately using new tools.

They sized 32 specimens with laser instruments between 2012 and 2016, finding that the 10 tallest individuals ranged from 59.2 to 81.5 metres in height and 0.98 to 2.55 metres in diameter. Hemp estimates from growth rates that the arboreal behemoths are between 500 and 600 years old.

The world's tallest trees are not normally found in Africa: for example, a 116-metre-tall sequoia tree grows in North America, and a 100-metre-tall eucalyptus in Australia. This is probably a result of both a shortage of studies in Africa, so many trees are overlooked, and the fact that many of the continent's tree species grow in places where limited resources prevent them from getting too tall. The latter is not the case at Kilimanjaro, where a combination of nutrient-rich volcanic soils, high temperatures and precipitation have probably helped drive the growth of *E. excelsum*.

The massive trees play an important role in the mountain's buzzing ecosystem, harbouring ferns and multiple other plants that grow on them for physical support. "They are like a city in the forest," says Hemp.

But the green giants face the threat of illegal logging, which has plagued their precious habitat. The team therefore suggests that the valleys harbouring the giants be included in the neighbouring Kilimanjaro National Park for protection.

David Seaborg at the World Rainforest Fund in Walnut Creek, California, supports this view. He points out that protecting the trees could also allow us to preserve the abundance of plants, birds and insects that benefit from their presence.

newscientist.com

Global: Most wood energy schemes are a 'disaster' for climate change

Using wood pellets to generate low-carbon electricity is a flawed policy that is speeding up not slowing down climate warming. That's according to a new study which says wood is not carbon neutral and emissions from pellets are higher than coal. Subsidies for biomass should be immediately reviewed, the author says.

But the industry rejected the report saying that wood energy cuts carbon significantly compared to fossil fuels.

While much of the discussion has focussed on wind and solar power, across Europe the biggest source of green energy is biomass. It supplies around 65% of renewable power – usually electricity generated from burning wood pellets. EU Governments, under pressure to meet tough carbon cutting targets, have been encouraging electricity producers to use more of this form of energy by providing substantial subsidies for biomass burning. However this new assessment from Chatham House suggests that this policy is deeply flawed when it comes to cutting CO2.

According to the author, current regulations do not count the emissions from the burning of wood at all, assuming that they are balanced by the planting of new trees. Duncan Brack, the independent environmental policy analyst who wrote the report, says this idea is not credible. "It doesn't make sense," said Mr Brack, who is also a former special adviser at the UK Department of Energy and Climate Change.

"The fact that forests have grown over the previous 20 or 100 years means they are storing large amounts of carbon, you can't pretend it doesn't make an impact on the atmosphere if you cut them down and burn them. You could fix them in wood products or in furniture or you could burn them, but the impact on the climate is very different."

Mr Brack says the assumption of carbon neutrality misses out on some crucial issues, including the fact that young trees planted as replacements absorb and store less carbon than the ones that have been burned. Another major problem is that under UN climate rules, emissions from trees are only counted when they are harvested. However the US, Canada and Russia do not use this method of accounting so if wood pellets are imported from these countries into the EU, which doesn't count emissions from burning, the carbon simply goes "missing".

Burning wood pellets can release more carbon than fossil fuels like coal per unit of energy, over their full life cycle, the author argues. Often the products have to travel long distances increasing the emissions associated with their production and transport.

Within the EU, the UK is the biggest importer of wood pellets for heat and power, with some 7.5m tonnes shipped from the US and Canada in 2015–16. Most of these imports comes from the southeast US, where there are growing concerns about the trade. "This report confirms once again that cutting down trees and burning them as wood pellets in power plants is a disaster for climate policy, not a solution," said David Carr, General Counsel of the Southern Environmental Law Centre in the US. Forests in our region, the southeast US, are being clear

cut to provide wood pellets for UK power plants. The process takes the carbon stored in the forest and puts it directly into the atmosphere via the smokestack at a time when carbon pollution reductions are sorely needed."

Within Europe the push for pellets is also providing incentives for the forest industry to plant more and harvest more trees. Environmentalists are worried that the system is creating a cycle that can't keep up with itself. "If you keep increasing your harvest over a period of time you will never be able to recoup your emissions from burning that growth, you will never catch up with yourself," said Linde Zuidema from Fern. "They are shooting themselves in the foot, they are not taking into account that increased harvesting of trees will actually have an impact on the role that forests play as a carbon sink."

Biomass industry sources though have been critical of the report saying that it is a fallacy that it takes decades for a forest to recapture carbon. "Biomass delivers a massive cut in carbon emissions compared to fossil fuels. That principle is at the heart of the industry," said Dr Nina Skorupska from the Renewable Energy Association. "The whole supply chain is monitored in detail to ensure we cut greenhouse gas emissions by at least 60% compared to fossil fuels, although the reality is often closer to 80%. On top of that, there is a significant body of peer-reviewed academic studies, ensuring that this industry is doing what it says on the tin. And it is: biomass cuts carbon, supports forests and delivers reliable renewable energy at a lower cost."

As well as the core concern that biomass is a flawed approach to renewable energy, the new study also highlights concerns over the use of BECCS – bio-energy with carbon capture and storage.

Scientists, including the Intergovernmental Panel on Climate Change (IPCC), have suggested that this system could be used to suck carbon from the atmosphere to keep the world from dangerous levels of warming.

"It's really worrying," said Duncan Brack. "The number of scenarios that the IPCC reviewed that rely on BECCS for ambitious climate change targets, it's crazy, I'm not the only person who's said that."

Concern is growing about the continued use of wooden pellets and chips for electric power. The EU has proposed a new system for biomass under its revised Renewable Energy Directive. Duncan Brack says it's a good opportunity to review the current methods of giving subsidies for the use of wood energy across Europe. The use of saw mill waste should be encouraged – but the burning of pellets should be curtailed. "The simplest way is to limit support to those type of biomass that really represent genuine carbon savings, primarily sawmill waste and post-consumer wood waste," said Duncan Brack. "I would rather see support for forest industry, not forest energy."

bbc.co.uk

Norway: The world's tallest wood house will be built at the brim of lake Mjøsa

Next year, a unique hotel will be open for check-ins, showing off the green shift and snatching a world record at the same time. In Norway, the quest to erect the world's tallest wood building now seems to have become a sport in itself. For a while, Kirkenes were planning to snatch the record, but it was the apartment complex Treet (The Tree) in Bergen that became the reigning world champion when it opened its 51 wooden metres back in December of 2015. As is often the case, victory turned out to be a fleeting thing.

When the University of British Columbia completed work on all 53 meters of the Brock Commons student housing project last September, Treet was reduced to just a very pretty, very tall building. However, the record now seems to be headed back towards Norwegian shores.

In 2018, Mjøstårnet (The Mjøsa Tower) will be built in the town of Brumunddal, right next to Norway's biggest lake, Mjøsa. The building is a hotel where both the main construction and panelling will consist of glue laminated timber and massive wood.

According to the website Horecanytt, the hotel will reach a height of around 80 metres, a space of around 8,000 square metres, and a price tag of around NOK 450 million. As for the building materials, they will for the most part be sourced from local producers.

"In the same way that the Eiffel Tower signifies Paris, Mjøstårnet will signify Brumunddal", says property investor Arthur Buchardt to Ringsaker Kommunes Næringsmagasin. "The tower will produce the same amount of energy that it spends. This will be achieved through solar thermal energy, solar cell panelling and heat pumps directed at both earth and water. This whole project will demonstrate 'the green shift' in practice."

Apart from the hotel, Mjøstårnet will contain office spaces, and will also be connected to a large swimming pool on the ground floor. "The three walls that surround the big room containing the swimming pool will have windows along the entire facade, allowing light into the entirety of the hall. The windows are placed at a height that allows swimmers to gaze out onto the landscape", says Øystein Elgsaas from Voll Arkitekter, the architecture firm responsible for Mjøstårnet.

At the same time, Elgsaas underlines the interplay between Mjøstårnet and the Mjøsa river. "The facades of Mjøstårnet will be dressed in wood panels in a stylized and repeating pattern inspired by the movement of the water and the way light dances on the ripples of its surface."

visitnorway.com

Canada: Designer forests – Scientists hope to tune up Canada's trees to thrive in changing climate

Forest geneticists aim to tune up Canada's working forests with trees better suited to changing climate conditions and that increase timber yields by up to 30 per cent in the bargain. The $5.8-million project won't be creating genetically engineered trees, rather the researchers will scour the genes of diverse existing populations of important species such as Douglas fir and lodgepole pine for useful and often highly localized adaptations to heat, cold, drought, snow and rain.

"Trees of the same species from warm places tend to grow longer and faster than trees from colder places, but they might be less cold hardy," said lead researcher Sally Aitken, a forestry professor at the University of British Columbia. "So there is significant genetic variation between a larch from one place and another."

The CoAdapTree project will identify trees with patterns of traits better adapted to areas where existing tree populations are struggling because of climate change. "Better matching trees with new climates will improve the health and productivity of planted forests," she said, adding the new approach using genomics and seedling trials will yield answers within a few years.

The strategy is a departure from traditional thinking, going back centuries, which held that the local populations of trees would be best adapted to their immediate environment. Based on that thinking, the seeds used to grow trees for reforestation would be gathered from local tree populations, grown and returned to the same area. No more.

Trees in any specific region tend to be adapted to the historical climate of that region. But as climate changes, the comfort zones for tree populations are moving north or to higher elevations, forcing the trees to chase the cooler or wetter conditions they prefer, said Aitken.

But the comfort zones are changing much faster than tree populations can adapt. "The fastest that a tree species can migrate is no more 100 to 200 metres per year," she said. "Climate is moving several kilometres a year. My colleagues at the University of Calgary estimate that trees are lagging 130 kilometres behind their optimal climate already."

The researchers hope to apply their findings to the planted forest, which provides hundreds of thousands of jobs and contributes $20 billion to Canada's economy. "We plant about 250 million trees a year in this province and that number is about to rise, so if we are going to all that trouble and expense, we should be trying to plant the right trees in the right places," Aitken said.

The coming carnage in B.C.'s natural forests makes getting reforestation right all the more urgent. "The managed land base of B.C. is just over one third of our area, so all those areas that we don't manage, where we don't plant trees, nature will take its course," she said. "Forests are resilient and they will adapt, but it's going to take generations and there will be a lot of mortality in the interim."

"In the meantime, (the natural forests) will not be storing as much carbon nor providing all the ecological services that we are used to while they endure an unhealthy state," she said.

Funding for CoAdapTree is provided by the B.C. Ministry of Forests, Genome Canada, Genome B.C. and Natural Resources Canada, among others.

vancouversun.com

USA: Americans once moved away from forests. Now forests are moving away from Americans

Over several decades in the past century, city populations swelled as Americans moved away from rural forests. Now the forests are moving farther away from Americans.

A new study of satellite images taken over 10 years starting in 1990 shows the rural forest canopy disappearing. Forest space disappeared from the United States in such big chunks that the average distance from any point in the nation to a forest increased by 14 percent, about a third of a mile.

While that's no big deal to a human driving a car with a pine-scented tree dangling from the rearview mirror, it is to a bird hoping to rest or find food on epic seasonal flights across the globe, according to the study published Wednesday in the journal PLOS One.

But forests aren't just for the birds. They improve the quality of life for fauna and flora, from bears to flowers. Altering forests can change the dynamics of ecosystems and can potentially "affect water chemistry, soil erosion, carbon sequestration patterns, local climate, biodiversity distribution and human quality of life," a statement announcing the report said.

Using forest maps over the continental United States, researchers Sheng Yang and Giorgos Mountrakis of the State University of New York at Syracuse marked tree canopy that disappeared over a decade in red to highlight the change. In one illustration included in the study, the page appeared to bleed.

"So if you are in the western U.S. or you are in a rural area or you are in land owned by a public entity, it could be federal, state or local, your distance to the forest is increasing much faster than the other areas," Mountrakis said. "The forests are getting further away from you."

One of the findings of the study is a twist that Yang, a graduate student, and Mountrakis, an assistant professor at the College of Environmental Science and Forestry, didn't anticipate. The disappearance isn't happening in cities, where people often

complain about the uprooting of trees for development. It's happening in rural America, where trees are falling and hardly anyone hears.

That finding turns conventional wisdom about forest loss on its head, Mountrakis said. "The public perceives the urbanized and private lands as more vulnerable, but that's not what our study showed," he said. "Rural areas are at a higher risk of losing these forested patches."

"Typically we concentrate more on urban forest," said Sheng, "but we may need to start paying more attention — let's say for biodiversity reasons — in rural rather than urban areas. Because the urban forests tend to receive much more attention, they are better protected."

While people in the sticks are losing their forests, the relationship between urban dwellers and trees is a love story. Dating back to when President Thomas Jefferson denounced the removal of trees that cooled the new capital city as "a crime little short of murder," Jill Jonnes wrote in her book, "Urban Forests," city slickers have fought to defend the little green space they get.

Rock Creek Park in the District of Columbia, Central Park in New York, Piedmont Park in Atlanta, Griffith Park in Los Angeles, and Golden Gate Park in San Francisco are examples of urban forests that are fussed over, pampered and protected by law. They are also cherished gathering places that help define their cities.

The remote areas that Americans have come to know as wild lands are being whittled away by farms, development and wildfire, particularly in the West, Mountrakis said. Arizona, Colorado and Nevada saw significant attrition or separation of forests, according to the satellite images.

In California and Colorado, trees stressed by drought are being eaten to death by beetles, standing dead on mountainsides by the hundreds of millions, virtual ghost forests. Ecologists argue whether fires that might consume them are a good or bad thing, in that it would kill the beetles yet threaten homes too close to the forest edge. Human development is another grim agent of tree canopy loss.

The researchers said they hope public land managers, such as the U.S. Forest Service and Bureau of Land Management, along with officials at the state level, will pay attention to their research. They hope to follow up the study with research into the drivers behind the loss of forests.

But the pictures don't lie, he said. There's no doubt that huge clumps of trees are disappearing. "You can think of the forests as little islands that the birds are hopping from one to the next," Mountrakis said. The loss of forests has side effects. It alters the local climate, decreases biodiversity and leads to soil erosion. "This is the major driver — we can link the loss of the isolated patches to all these environmental degradations," he said.

The study tracked the loss of forest by calculating the distance to the nearest forest from all points on an area map, Mountrakis said. They noticed that some chunks of tree space disappeared within a forest, but that has less of an environmental impact as forests that wither on the edge, slowly transforming them into islands.

washingtonpost.com

Ireland to Plant Largest Grove of Redwood Trees Outside of California

An estate in Ireland has revealed plans to create a redwood grove that will be the largest of its kind outside California. The initiative serves as a testament both to Ireland's heritage and its commitment to fighting global warming.

The initiative, Giants Grove, is spearheaded by the seventh Earl of Rosse, Brendan Parsons and the environmental organization Crann, which promotes the preservation of trees, hedgerows and woodlands throughout Ireland.

The Earl has designated land on the grounds of the Birr Castle Gardens in Offlay to house around 2,000 redwoods, making it the biggest forest outside of California.

What's more, this would be a historic homecoming for redwoods. The trees were once abundant in Ireland but were largely wiped out following the last Ice Age.

Lord Rosse explained:

> "Our grandchildren, their grandchildren, Birr, Ireland and the world will benefit from this magnificent forest grove. These will be the biggest trees in Ireland and the largest collection outside of California. By investing in this project with us, the sponsors will have the opportunity to make a personal impact on Ireland's environment and world biodiversity conservation."

As stated above, the project will be supported by the estate and other groups, but it aims for public funding. Individuals will be able to sponsor an area within the giant redwood plantation, ensuring the site and the redwoods themselves will last for future generations.

The notion isn't just to return a piece of Ireland's lost heritage, though. Giants Grove will attempt to help redwood forests and other ecosystems unique to Ireland survive.

The trees face significant pressures, including the effects of climate change. Rising temperatures and a resulting lack of coastal fog means that California's plantation has measurably declined in health. Other stress factors like land clearing and human encroachment mean that tree health isn't as robust as environmentalists would like it to be.

What's more, recent studies suggest that trees like the giant redwoods are crucial for their ability to fight climate change itself. Thus, ensuring their survival helps to ensure ours.

This project will also work to maintain Ireland's forest cover—and that's got an environmental importance of its own.

This is a trial in future-proofing, as Ireland is predicted to warm up significantly due to climate change. By planting redwoods now, the country could be taking steps to transition into that warmer climate with habitable forests already in the making.

It's a smart idea—and one that conservation groups believe may be the key to preserving future biodiversity.

So what's next?

The aim of the project is to deploy the redwoods in two phases. Phase one is slated to begin this autumn, while the second phase will occur in the spring of 2017. Both phases will include planting the giant coastal redwoods to create an inner copse, which will then be surrounded by the more robust giant mountain redwoods. Some native trees will also be included, such as holly trees, to encourage biodiversity and to provide interest for forest visitors.

To be sure, this project alone cannot ensure the survival of the redwoods or keep Ireland's biodiversity intact. However, the project has been greeted warmly by environmentalists who view this as an example in maintaining biodiversity for other nations. While climate change will mean we need to approach conservation differently, there are transition strategies that can enrich environments.

The Giants Grove project, then, is an exciting seed of an idea for long-term biodiversity conservation.

ecowatch.com

Indonesia: WWF and Greenpeace break with Indonesia's pulp and paper giant

The construction of a 3km canal in Indonesia has led Greenpeace and WWF to suspend its partnership with one of Indonesia's biggest pulp and paper companies. Riau Andalan Pulp and Paper (Rapp), a subsidiary of Asia Pacific Resources International Limited (April), dug the canal through thick peat forest on the island of Pedang, just off the east coast of Sumatra. In doing so, April not only flouted its own sustainability standards but went against government regulations and a letter of instruction issued by the Ministry of Environment and Forestry last year asking companies to block existing canals.

Drainage canals dry out peatland, releasing carbon emissions and creating the conditions for forest fires. Before last year, companies used to dig canals through deep peat forests in Sumatra with impunity, transforming once wild landscapes into monoculture acacia and palm plantations for the paper, pulp and palm oil industries. Both palm and acacia require good drainage.

But then came the catastrophic fires of 2015 that spread a toxic, yellow haze across Indonesia and its neighbours. The fires burned up 2.6m hectares and cost the country $16.1bn (£12.8bn), according to the World Bank. A recent study calculated the pollution from the fires may have led to 100,000 early deaths.

In October 2015, President Joko Widodo called for blocking all canals as a way to restore degraded, fire-prone landscapes by lifting water tables, making it harder for fire to start and stay ignited.

April insists the construction of the canal this year was due to a misunderstanding of government regulations. In minutes of a Stakeholder Advisory Committee (SAC) meeting posted for about half an hour on the April website, the company said it misinterpreted a government decree and "mistakenly concluded this canal was mandated by government regulations".

Indeed, a report published in August by April's Independent Peat Expert Working Group (IPEWG) suggests canals could be used to combat fires, which is in fact the exact opposite of the government's regulations. "[April] wanted to create the impression that canal construction was seen as part of these regulations, whereas the regulations actually refer to canal blocking," says Andy Tait, senior campaign adviser at Greenpeace.

Tony Wehas, the president and director of Rapp, has insisted building the canal and planting acacia in the cleared peatlands was legal because the plan had been approved by the Indonesian government back in 2013. But that approval was given before the fires, the government's new decrees, and April's tougher sustainability commitment. Wenas also said the new canal was built as a fire break and not for drying out the peatland.

Yet the minutes of the SAC meeting said the company "made mistakes" in constructing the canal. "April has apologised to all parties concerned and is preparing a full explanation," reads the minutes. In response to the construction of the canal and deforestation in the region, the government gave April a verbal censure but has not taken any further action.

The incident – and rising mistrust – has led Greenpeace and WWF to suspend their work on April's SAC. Both groups say they can no longer work with a company they feel is not being forthright. Tait says Greenpeace has been concerned for some time about April's limited follow up on key parts of its sustainability policy.

Owned by Royal Golden Eagle, April has long been a target of environmental groups for forest destruction and conflict with locals. Its concession on the island of Pedang has proven one of the most controversial due to opposition by the majority of villages in the area. The company is also known for its obfuscation. In 2013 then-external affairs director David Goodwin asked Guardian journalist John Vidal to "pause" filming when asked very basic questions about April's operations, such as how many trees were cut down over the last year. "We're not involved in deforestation," Goodwin said, despite the fact that the company had been cutting down natural rainforest and planting monoculture plantations for over a decade.

After years of targeted campaigns, the company appeared to have a change of heart in 2015. It strengthened its sustainability policy enough to bring on board longstanding critics Greenpeace and WWF. The new policy included no new clearing of forests on peatlands and an investment of $100m over 10 years for peatland restoration and conversation. But, within months, the company fell foul of environmental groups after it was caught clearing the forest on Pedang, the same concession where it would be caught with a giant canal several months later.

"April needs to admit that draining peatland for pulp plantations is unsustainable and instead block its drainage canals and announce a major investment in plantation species that don't require drainage," says Tait.

April has yet to reply to the Guardian's request for comment.

theguardian.com

Guyana: UK's biggest buyer relaxes outright ban for greenheart

More than a year after one of the biggest traders in the United Kingdom (UK) placed a procurement ban on Guyana's greenheart timber, significantly curtailing exports, there is a move underway to send a shipment. The shipment will be made by Wijma, a UK sales and distribution division of Dutch European Sustainable Tropical Timber Coalition (STTC), which hopes to deliver the first greenheart to its customers in early in the new year. The timber will be coming from Iwokrama International Centre for Rainforest Conservation and Development, which a few months ago made significant strides when it was certified by the Forest Stewardship Council.

The STTC is an alliance of industry, business, government and NGOs dedicated to increasing European demand for sustainably sourced tropical timber. The forest, located in the forest-rich Guiana Shield region and managed by the Iwokrama International Centre for Rainforest Conservation and Development, was audited by the Soil Association, with backing from STTC founder and supporter IDH, the sustainable trade initiative.

According to Iwokrama, following pre-assessment last May, the FSC certificate was awarded on October 14. Half the forest will be kept as 'wilderness reserve' and half as 'sustainable use forest', with a harvest cycle based on natural regeneration, allowing removal of 10 trees per hectare and stipulating reduced impact logging.

Greenheart is widely used in the UK and across the rest of Europe in marine applications. But in the UK, where it is especially popular for sea defences, the Environment Agency (EA) issued a procurement ban in 2015 after assessing that proof of sustainable sourcing was inadequate. "The EA have now removed the outright ban on greenheart after we advised them of the FSC certification awarded to Iwokrama," said Damian Cole of Wijma UK. "They will accept Category A FSC 100% Greenheart from Iwokrama, but at the same time say that Category B timber from Guyana [which is material under UK rules backed by other forms of sustainable sourcing documentation] does not meet their requirements."

Wijma will be among the first suppliers to put the certified greenheart on the market and the customer for its initial shipment will be the EA itself, which undertakes timber procurement for public projects. The timber is for sea defences at Dawlish Warren on the south coast.

A range of other species is available from the Iwokrama forest, including purpleheart. Whether the UK's EA will specify these too remains to be seen, but it has a programme to evaluate and increase use of lesser known tropical timber species.

Earlier this year, when it became public knowledge that UK's greenheart market was in deep trouble because of EA's stance, Government and the private sector had announced collaborative efforts to have it reversed. Minister of Natural Resources, Raphael Trotman; and Minister of Business, Dominic Gaskin; met with representatives of the private sector and stakeholders of the logging industry to tackle the issue.

The restrictions, which have cut exports of wood products to UK by almost 65 percent, since the May 2015 advisory by the Environment Agency (EA), has been engaging Government and stakeholders, it was disclosed. EA is one of UK's biggest buyers of lumber for state projects in that country. Greenheart was until a year ago widely used in sea defence projects by UK contractors. Government and private sector agreed to take the matter to the diplomatic level, among other things. According to Minister Gaskin, the issue had indeed a troubling one that should be of concern to all Guyanese.

Greenheart, he stressed, is part of the "Guyanese identity" with the current procurement restrictions harming exports and local production. Minister Trotman made it clear that the issue is of concern to Government with the focus on finding solutions now. According to the Minister, Guyana's systems of monitoring and verification to ensure logging is done in a sustainable and legal manner have been tested and proven over time. It is a standard that is not only recognised by the current EU-FLEGT negotiations but by Norway, which has a US$250M agreement with Guyana for the protection of the forests here. More than US$100M has been paid out, after intense checks were carried out by inspectors to ensure that deforestation levels are kept at manageable levels and that logging is conducted in a sustainable and legal manner.

The main concern, Trotman had said, is to ensure that Guyana's reputation is kept intact where forestry activities are concerned. Guyana was supposed to engage its High Commissioner to UK, Hamley Case, who has intense knowledge of the country's forestry sector.

Over the last four years, Greenheart exports were a massive US$27M. The impact saw Guyana's Greenheart exports nosediving last year from US$3.2M in 2014 to US$1.1M last year. This represents a massive 65% decline. In effect, the EA decision has tarnished Guyana's reputation and could impact investments in the forestry sector. Already, the impact on logging activities is being felt, with jobs and markets affected. Not only is foreign exchange earnings affected, but also the lives of thousands of Indigenous persons have been impacted. EA did not consult with Guyana on the issue, officials said. Timber represents a major export earner for Guyana, last year totaling US$45.6M, compared to the US$54.1M in 2014.

The Iwokrama International Centre (IIC) was established in 1996 under a joint mandate from the Government of Guyana and the Commonwealth Secretariat to manage the Iwokrama forest, a unique reserve of 371,000 hectares of rainforest, "in a manner that will lead to lasting ecological, economic and social benefits to the people of Guyana and to the world in general".

kaieteurnewsonline.com

Global: How nature creates forest diversity

Forests, especially tropical forests, are home to thousands of species of trees – sometimes tens to hundreds of tree species in the same forest – a level of biodiversity ecologists have struggled to explain. In a new study published in the journal *Proceedings of the National Academy of Sciences (PNAS)*, researchers at the International Institute for Applied Systems Analysis (IIASA) and their colleagues in Australia are now providing a first model that elucidates the ecological and evolutionary mechanisms underlying these natural patterns.

"Forests in particular and vegetation in general are central for understanding terrestrial biodiversity, ecosystem services, and carbon dynamics," says IIASA Evolution and Ecology Program Director Ulf Dieckmann. Forest plants grow to different heights and at different speeds, with the tallest trees absorbing the greatest amounts of sunlight, and shorter trees and shrubs making do with the lower levels of sunlight that filter through the canopy. These slow-growing shade-tolerant species come in an unexpectedly large number of varieties--in fact, far more than ecological models have been able to explain until now.

Traditional ecological theory holds that each species on this planet occupies its own niche, or environment, where it can uniquely thrive. However, identifying separate niches for each and every species has been difficult, and may well be impossible, especially for the observed plethora of shade-tolerant tropical trees. This raises the fundamental question: are separate niches really always needed for species coexistence?

In the new study, the researchers combined tree physiology, ecology, and evolution to construct a new model in which tree species and their niches coevolve in mutual dependence. While previous models had not been able to predict a high biodiversity of shade-tolerant species to coexist over long periods of time, the new model demonstrates how physiological differences and competition for light naturally lead to a large number of species, just as in nature. At the same time, the new model shows that fast-growing shade-intolerant tree species evolve to occupy narrow and well-separated niches, whereas slow-growing shade-tolerant tree species have evolved to occupy a very broad niche that offers enough room for a whole continuum of different species to coexist--again, just as observed in nature.

Providing a more comprehensive understanding of forest ecosystems, the resulting model may prove useful for researchers working on climate change and forest management. Dieckmann says, "We hope this work will result in a better understanding of human impacts on forests, including timber extraction, fire control, habitat fragmentation, and climate change."

eurekalert.org

Austria: Global warming is increasing forest fire risk in the Alps

Near the end of Austria's record-hot 2015 summer, the forests above the Danube near Linz were sapped out. Dry beech and oak leaves crackled at lower elevations, where the trees baked for weeks under a dome of dry desert air. Daily highs topped 35 degrees Celsius (95 degrees Fahrenheit) for 13 straight days, smashing the previous streak of five days, set during the ferociously hot summer of 2003.

A little higher up, away from the river, there are fire-warning signs at the edge of an 80-hectare plantation of pines that's under attack by bark beetles. A year before, the insects claimed an even larger patch nearby. None of the old-timers in the area can remember seeing the tree-killing bugs on such a scale, naturalist Georg Schüssenegg said during a guided hike to a Danube lookout point.

To the south, the glinting edge of the Alps baked under the summer sun. Throughout the region, climate trackers, as well as forest managers and firefighters, were on edge. Never had such a high fire danger prevailed for weeks on end, he said.

This is a preview of conditions expected much more frequently on a greenhouse gas-warmed Earth, according to new regional and global climate studies that project widespread increases in forest fire danger.

Some of the studies zoom in on the Alps, suggesting fire seasons will be 30–50 days longer by 2050 – not surprising considering the Alps are heating up twice as fast as the global average.

With another 4 to 6 degrees Celsius warming expected by 2100, some forests in this historically cool, wet region could pass a climate tipping point, making them more susceptible to large and catastrophic fires.

As the hot summer faded into a warm and dry autumn, Austrian foresters issued unprecedented fire warnings in December, cautioning holiday revelers against setting off fireworks because of dry conditions.

Just before Christmas in 2016, a small but stubborn fire burned in the mountains of Styria, in an area that would normally be covered with several feet of snow that time of year.

"Most fire ecologists have been reluctant to attribute extreme fires to climate change – but in the last few years we have crossed a line," said David Bowman, a University of Tasmania fire geographer who tracked the growing global wildfire footprint in a study published February 6 in the journal Nature Ecology and Evolution.

"The anomalous weather has become consistently anomalous – the new normal. I am confident we are seeing climate change play out in fires," he added.

A close look at 478 of the most extreme fires between 2002 and 2013 showed the close link between disastrous fires and extreme droughts and heat waves. The study projects that the

number of days conducive to extreme fires will increase by 20 to 50 percent globally by mid-century.

"I've been studying unusual fires for years, and I can't keep up," Bowman said, describing a decade during which new fire extremes, from Chile to Australia to western North America, burned at a dizzying pace.

One of the findings is that fires are burning in vegetation that's not archetypically combustible. "That means places that are not fire-adapted could see more severe fires in the years ahead," he said.

"Global warming is a double whammy for our forests," Schüssenegg explained. Heat waves dry the trees out, so that they can't repel the bugs with their natural defense mechanism, pitch. Dead, dry branches and leaves build up on the ground, ready to burn.

At the same time, warmer conditions allow bugs to breed faster and more often. "More bugs kill more trees. More dead trees means more fire danger. Hold your breath and listen very closely. You can hear them," he said.

Sure enough, a low-level buzz, more vibration than sound, pervades the still afternoon, as millions of the tiny black bugs chomp beneath the bark of drought-stricken trees to lay their eggs. In a year, all the needles will be red, all the trees will be dead.

This is the third generation of beetles born this summer, so they've spread across more forests, Schüssenegg said. "In the 60s and 70s, they were only breeding once per year. Last month, lightning caused a small fire along the edge of that pasture," he said, pointing to a narrow strip of dead and dying pines.

Those local observations don't surprise Harald Vacik, who has been studying Austrian forests for 20 years. For six years, he's been part of a team systematically cataloging wildfires in the country.

Before then, accurate records are sparse, Vacik said, simply because forest fires just hadn't been very common in Austria's moderate and moist climate. But just in the past few years, fires have burned in unexpected places and at unusual times of year. And making accurate projections may help save lives and property. A July 2014 blaze in Sweden that burned 13,800 hectares caught government agencies partly by surprise, said Vacik, who also referred to recent rare fires in chestnut forests of the Swiss Engadine, an important tourism region.

The research Vacik and his team compiled at the Institute for Silviculture at the Vienna University of Natural Resources and Life Sciences shows a decade-long tendency of fire seasons starting earlier in the spring and ending later in the year.

During that same time span, the snow cover has dramatically melted back in the spring, which means the vegetation has more time to dry out. And that trend will likely continue: by 2100, the Alps could lose 70 percent of their snow cover, scientists with the École Polytechnique Fédérale in Switzerland said in a study published recently in the journal Cryosphere. "The most affected elevation zone for climate change is located below 1,200 meters [about 3,900 feet], where the simulations show almost no continuous snow cover towards the end of the century," the researchers wrote.

The study described findings with troubling implications for the environment, including an increased risk of fires in dry forests and fields.

A 2010 paper by forest scientists with the Technical University in Munich focused on Bavaria, showing that areas near the Alps will see more days when fire danger is high, while low-lying regions farther north will see a decrease because more rain is expected to fall. Similarly, in 2014, a group of Austrian scientists looked specifically at Tyrol, showing "a strong concentration of potential fire danger along the main valleys and in the drier Tyrolean Upland."

The overall picture for the Alps, in light of global warming, is of dryer mountains with more fires. Whether regional authorities can rise to the challenge of managing these risks remains to be seen.

dw.com

Gabon: Protected land isn't keeping African Forest Elephants safe

It turns out elephants aren't safe from poachers even when they are living on protected land.

In 2004, an estimated 35,000 forest elephants lived in Gabon's Minkébé National Park in Africa. But new research from Duke University says around 80 percent of those elephants had been killed by poachers by 2014. Forest elephants' tusks are made of an extra-hard ivory that's pinkish in color, making them a prime target for poachers.

This latest finding seems to build on a 2013 estimate that as many as 100 of these elephants were being killed every day. "Studies showing sharp declines in forest elephant populations are nothing new, but a 78 to 81 percent loss in a single decade from one of the largest, most remote protected areas in Central Africa is a startling warning that no place is safe from poaching," Duke University researcher John Poulsen said.

Gabon's government has attempted to stop the poaching of its elephants by creating a National Park Police force and increasing the prison terms for ivory poachers. The Duke researchers say Gabon needs to work more with law enforcement across its borders. Poachers from its neighbor to the north, Cameroon, play a large part in the illegal ivory trade.

The northern part of the national park is only about four miles from Cameroon, making it pretty easy for poachers from that country to cross into the park.

Experts estimate there are now only 75,000 forest elephants living in central Africa.

newsy.com

Singapore: Three-fold drop in incidents of falling trees since 2001

The number of incidents involving falling trees and branches has dropped three-fold since 2001, Senior Minister of State for National Development Desmond Lee said in Parliament on Tuesday, March 7.

Responding to questions from Non-Constituency Member of Parliament Dennis Tan on tree management. Mr Lee said that there were around 3,000 such incidents recorded in 2001. That figure shrunk to 800 last year, against "a backdrop of around seven million trees", where two million of them are along streetscapes and parks.

Speaking in Parliament during the debate on the budget for the Ministry of National Development, Mr Lee attributed the drop to the comprehensive tree management programme by the National Parks' Board (NParks). However, he acknowledged that even with improved efforts, "we are deeply saddened every time such incidents (of falling trees) cause injury or loss of life". For such cases, the NParks will provide assistance to the police. Independent arborists, who are trained in caring for and maintaining trees, may also be engaged on a case-by-case basis.

Last month, a falling tree at the Singapore Botanic Gardens killed one woman and injured four others. Two days later, a falling tree on Yuan Ching Road caused one woman to suffer serious head injuries.

Mr Lee said that NParks' tree management programme includes a "rigorous regime of inspections and pruning", which are aligned with international standards. Inspections are carried out by certified professionals, and the records are digitised and kept indefinitely.

The records allow NParks to focus attention on storm-vulnerable trees and pre-emptively replace them, he added.

Mr Lee assured the House that NParks has ramped up inspections, and taken steps to improve general tree health, including using pruning techniques to improve tree structure and balance.

The agency is also developing modelling techniques to understand better the structural behaviour of trees in microclimatic conditions as well as under heavy rain and wind, he said.

todayonline.com

UK: Hundreds of previously undiscovered ancient oak trees found in English countryside

The mighty oak has been central to English history and culture for centuries. Now new research is revealing precisely why. A nationwide survey has just revealed that England has more ancient oak trees than the rest of Europe put together. Over the past four years, tree historians have discovered 1,200 previously unknown but still surviving mediaeval and Tudor oaks, pushing the grand total for such trees in England to a remarkable 3,400.

About 85 per cent of them are between 400 and 600 years old, while some 12 per cent date back 600 to 800 years, with 3.4 per cent (117 examples) dating back 800 to 1,000 years. The survey work has been coordinated by the Woodland Trust, working in conjunction with the Ancient Tree Forum, the Tree Register and the Royal Botanic Gardens, Kew.

By contrast, the figure for the whole of continental Europe is estimated to be just 2,000 ancient oaks – 1,260 of which are in Sweden, only some 120 in Germany and perhaps 300 in Romania. In terms of 800- to 1,000-year-old oaks, continental Europe has only 85–14 of which are in Sweden and 24 in Germany.

As well as increasing England's ancient oak inventory by more than 50 per cent, the new research also helps to explain why the oak has consistently been more central to English culture than it has been to many continental European ones.

Oaks are strongly represented in so many aspects of English history. It is the national tree of England and one of the most popular symbols of royalty in Britain – with, for instance, more than 500 pubs called the Royal Oak.

Oak trees, along with acorns and oak leaves, are also particularly common in English heraldry – and adorn countless English aristocratic coats of arms. The oak-built ships of the pre-mid-19th century Royal Navy were often known collectively as the Wooden Walls of Old England – and the official senior service march is still the 18th century anthem, "Heart of Oak". Indeed over the centuries, eight Royal Navy warships have borne the name Royal Oak – and the tree has been associated with historical characters ranging from Robin Hood to Charles II.

But why have so many more ancient oaks survived in England than have on the continent? Recently completed research, by Dr Aljos Farjon of the Royal Botanic Gardens, Kew, suggests that England's ancient oak heritage is a consequence of the country's unique political and cultural history.

England is the only major country in Europe to have been taken over, lock, stock and barrel, by a rival geopolitical entity – namely the Duchy of Normandy in 1066. "The Norman conquest not only changed the political structure and direction of England, but also initiated a total change in how much of the English countryside evolved," said Dr Farjon, author of a ground-breaking new book on England's oak heritage, *Ancient Oaks in the English Landscape*, due to be published later this Spring.

William the Conqueror's victory meant that all land in England belonged to the new king by right of conquest. It gave birth to a thoroughgoing feudal system in which the King gave land to dozens of tenants-in-chief (his barons). They, in turn, gave the right to exploit those lands (and their populations) to

sub-tenants (the more minor nobles). Among the lands which the King kept for his own exclusive use were the major forests – which he used for hunting. With the Royal Forests open for the hunt to only a privileged few, and to create their own hunting parks, the aristocracy imported southern Italian fallow deer to populate them (a strategy which was easier to achieve because the Normans also ruled southern Italy).

Indeed, within 140 years of the Norman conquest of England, the number of deer parks had gone up almost 60-fold (from 35 to at least 2,000) – and it is in those Norman-origin former hunting parks that about 50 per cent of England's ancient oaks can be found today. Hunting in thousands of relatively small hunting parks required two things – relatively open woodland (to allow hunters to actually see the deer they were hunting) and lots of deer. To a large extent, the sheer number of tree shoot-grazing deer helped prevent the woodland becoming too dense, which in turn favoured oak growth rather than the growth of rival beeches and limes.

Oaks are more slow-growing than those latter two species – and as a result can easily become overtopped (and therefore deprived of sunlight and thus killed) by them in dense forest environments. By contrast, deer parks, consisting of more open woodland, were ideal habitats for oaks to become truly ancient in – and that is what, courtesy of William the Conqueror and his nobles, seems to have happened in England.The Royal Forests and Chases contributed to the preservation of the ancient oaks in a similar way.

Partly because England's oaks were able to grow particularly old in so many deer parks, the distribution of ancient oaks around the country is very uneven. About 55 per cent of England's ancient oaks are to be found in just ten counties – Oxfordshire, Herefordshire, Worcestershire, Gloucestershire, Shropshire, Warwickshire, Berkshire, Wiltshire, Norfolk and Suffolk. Herefordshire is the top county, with 366 oaks older than 400 years.

The greatest single concentration is in part of the Blenheim Palace estate in Oxfordshire. In that one former deer park alone, Dr Farjon has found, over the past four years, 112 ancient oaks which started growing before the year 1600 – and elsewhere in the country he has succeeded in discovering a further 400 of similar vintage. It's the largest number of ancient oaks ever discovered by one individual in British botanical history.

The oldest oaks in Britain – each about 900 to 1,000 years old – are located in Merton (Cheshire), Lydham Manor (Shropshire) and Bowthorpe (Lincolnshire). These are all approximately 13 metres (43 feet) in circumference.

It's thought that, up until the establishment of the Forestry Commission in 1919, there had been thousands more ancient oaks in England. Tragically, many of them were felled – often in former Royal Forests – to make way for commercial forestry, particularly in the 1950s, 60s and 70s. In Europe commercial forestry had started two centuries earlier – and therefore contributed much to the relatively greater paucity of ancient oaks on the continent.

"Great oaks from little acorns grow" is a proverb of ancient Roman origin – but the new survey shows that, partly courtesy of Italian deer, it is England that now has the greatest abundance of truly ancient oaks in Europe.

independent.co.uk

Ghana: 'Where are all the trees, water bodies?'

President Nana Addo Dankwa Akufo-Addo has expressed grave concerns about the exploitation of Ghana's natural resources with little regard for future generations.

He said although citizens have the right to "exploit" resources to their benefit, this should be done without endangering them.

Delivering his speech at the nation's 60th independence anniversary at the Black Star Square Monday, the President said the country is losing its natural resources to destructive activities of some citizens.

"The dense forests, that were home to varied trees, plants and fauna, have largely disappeared," he lamented. "Our rivers and lakes are disappearing, and those that still exist are all polluted," he added.

Experts have said Ghana might import water from neighboring countries by 2020, a situation that is blamed on destructive human activities. The Tano River in the Brong Ahafo Region has dried up for the first time in 40 years.

Although the Region has faced a long period of drought, residents believe galamsey activities are to blame for the development. It is a view supported by the Environmental Protection Agency (EPA) and the Ghana Water Company (GWC).

Intervention by past governments to protect the depleting resources of the country have not yielded the right results.

Unhappy with the potential danger that lies ahead, President Akufo-Addo has called on Ghanaians to individually take responsibility for the protection of the "varied trees, plants and fauna."

"It bears repeating that we do not own the land, but hold it in trust for generations yet unborn. We have a right to exploit the bounties of the earth and extract the minerals and even redirect the path of the rivers, but we do not have the right to denude the land of the plants and fauna nor poison the rivers and lakes," he said.

The President said the best homage the citizens could pay to the nation's founders would be to safeguard the environment from destructive activities.

"Today, we import timber for our use, and the description of our land as a tropical forest no longer fits the reality," he said, works to regenerate the lands and water bodies must start in earnest.

myjoyonline.com

India: These unsung heroes always serve in the line of fire

There is someone in the forest risking life and limb, guarding the forest almost 24/7 with no proper meal, no proper equipment, and is paid a pittance. These brave, unsung heroes are the first line of defence in case of a fire. The job of a forest guard includes long working hours, and he is often forced to leave behind his family. The death of a forest guard two days ago while dousing the fire in Bandipur forest brings their plight back into sharp focus.

In Bandipur and Nagarhole national forests, which house the largest number of tigers in the country, there is a severe shortage of forest guards. The state government has not carried out recruitments regularly and the reluctance of guards working in other forest regions to accept a transfer to these wildlife sanctuaries has only added to the staff crunch.

This situation has, however, put immense pressure on forest guards in these national forests. They are often forced to handle two beats, instead of one. The major grouse of these foot soldiers is that they are not allowed to take leave on a regular basis. Guards are entitled to 45 days leave in a year, but a majority of them don't even take half of it. Though they do get paid for surrendering their leaves, most guards say that money can't match the need for a break from work.

A forest guard from North Karnataka says he is allowed to take just two days leave in a month. "It takes me more than 12 hours to reach home. There's not enough time left to spend with my family."

Another problem is that a majority of Anti-Poaching Camps (APC) where guards are stationed is out of cellphone coverage. "We can't contact our families for days. This leads to depression at times. It's a dog's life," says another guard who has been waiting for a transfer to North Karnataka region.

Only a few forest guards have the luxury of living with their families in official quarters. Sources add that guards and watchers don't get practical training on firefighting during the year-long training before joining the department, making it even more tough when faced with a wildfire. Guards also complained that the traditional method of dousing fire by beating the flames with wild plants puts them at risk. "Where will we find plants to douse the fire when the entire forest is dry? Why can't the authorities upgrade facilities when technology has advanced so much," asks another guard.

Between January and May, forest guards are rarely allowed to leave from work, with instances of senior officials warning them that they will be held responsible for fire incidents in their beats. A forest guard's salary ranges between ’16,000 and ’20,000 per month. "We are on duty 24 hours and we are paid peanuts. Guards in Bandipur and Nagarhole forests get an allowance of just ’700 per month. This is not enough to motivate us to continue with our jobs," says a guard.

newindianexpress.com

Ginkgo ‘living fossil’ genome decoded

The Ginkgo tree has had its genetic code laid bare by researchers. The tree is famed for being a "living fossil" – a term used to describe those organisms that have experienced very little change over millions of years. In the case of the Ginkgo, there are specimens preserved in the rock record from 270 million years ago, in the Permian Period.

The Chinese-led research team says the new information should help to explain the tree's evolutionary success. Its resilience is legendary: it was one of the few living things to survive the atomic bomb blast in the Japanese city of Hiroshima in 1945.

A Ginkgo is known to produce chemicals that are unpalatable to the insects that try to eat it, and will counter the fungi and bacteria that attempt to attack it. Researchers can now more easily identify the mechanisms that drive these capabilities.

The specific species sequenced in the study was *Ginkgo biloba*. It reveals the tree's genome to be huge, comprising some 10.6 billion DNA "letters". By way of comparison, the human genome contains just three billion letters.

Written in the Ginkgo's DNA code are roughly 41,840 predicted genes, the "templates" that the tree's cells use to make the complex protein molecules that build and maintain the organism.

The initial analysis of the genome, published in the journal GigaScience, suggests there has been extensive expansion through time of gene families that provide for a variety of defensive mechanisms.

Its anti-insect arsenal is particularly smart. The Ginkgo will synthesise one set of chemicals to directly fight a pest, but also release another set of compounds that specifically attract the insect's enemies.

bbc.co.uk